occurred 15 times, the adult flew to and fed a fledgling of its own choice unmindful of the intense begging calls of others. Once an adult brought a large grasshopper and gave it to fledgling B, but B was not able to swallow it and the prey fell down. The adult caught the prey in mid air and fed it to C.

A blackwinged kite (*Elanus caeruleus*) which flew over the area 30 m from the tree, was chased but the babbler group was tolerated to feed in and near the tree.

The fledglings after 1740 hrs. moved from tree to tree either alone or with the adults and covered a total of 85 m. At 1900 they roosted in an *Albizzia lebbek* tree where the babblers had already gone to roost at 1846. Last feeding of a drongo chick was at 1848. We have already recorded in the study area that drongos commence feeding earlier than other birds. The late feeding and early morning activity of drongos accord with Aschoff's rule (Daan and Aschoff 1975). Probably the helpers were chicks of an earlier brood.

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References

Daan, S. and Aschoff, J. (1975): Circadian rhythms of locomotor activity in captive birds and mammals: their variations with seasons and latitude. *Oecologia, 18*: 269-316.

Emlen, S. T. (1978): The evolution of Cooperative breeding in birds. *In*: Behavioural ecology—an evolutionary approach. pp. 245-281. Krebs, J. R, and Davies, N. B. (Eds.), Sinauer Associates, Inc. Massachusetts.

Gaston, A. J. (1978): The evolution of group territorial behaviour and cooperative breeding. *Am. Nat. 112*: 1091-1100.

Skutch, A. F. (1961): Helpers among birds. *Condor 63*: 198-226.

Sukkur, E. A. A. and Joseph, K. J. (1980): Breeding biology of the Black drongo. *J. Bombay nat. Hist. Soc. 75* (Supplement): 1212-1226.

Zacharias, V. J. and Mathew, D. N. (1977): Malabar Jungle Babbler *Turdoides striatus malabaricus* (Jerdon) and White headed Babbler *Turdoides affinis affinis* (Jerdon) jointly caring for the chicks of the latter. *J. Bombay nat. Hist. Soc. 74*: 529-530.

11. INSECTIVOROUS BIRDS ASSOCIATED WITH THE RICE ECOSYSTEM AT MADURAI

The principal agroecosystem around the Agricultural College and Research Institute, Madurai is the rice ecosystem fed by the Periyar-Vaigai irrigation system. The double and single cropping lands receive the canal water from June to February. The rains are received in the months of August-November and the water is stored in the tanks. The tanks also facilitate the presence of a rich aquatic biome in this area. From June to February or even to the middle of March there will be some crop of rice in the fields. The invertebrate fauna of the rice ecosystem include the pest forms such as the brown planthopper, green and white jassids, leafroller, stemborer, gallfly etc. and non-pest forms like water beetles, water bugs, odonates, and a variety of other insects, earthworms and crabs. The tanks also harbour fishes, frogs, crabs and aquatic insects. Naturally these conditions attract a host of in-

sectivorous birds to this ecosystem. A detailed observation was made on the insectivorous avian fauna visiting the rice ecosystem between May, 1979 and February, 1980 and the results are discussed below.

The observations were made at the Agricultural College farms, Chittankulam tank, Othakadai, Uthangudi, Ulaganeri, and the watersheds on the Madurai-Melur road extending upto Chittampatti. The field specimens were then and there compared with the authenticated guides by Fletcher and Inglis (1926), Ali (1941), Ali and Ripley (1969 and 1970) and Ganguli (1975) for nomenclature. The birds are classified in the following categories.

1. Very common: Seen on all the days in large numbers
2. Common: Seen on all days in less numbers
3. Less common: Seen on all days in less numbers at restricted places
4. Rare: Occasionally seen in singles or very few numbers.

The results are presented in Table 1. Among the birds the black drongo, *Dicrurus adsimilis* appears to be the most predominant insect hunter of the ecosystem. These birds usually perch on some convenient supports and capture their prey by sudden gliding sweeps. They were reported to feed more on injurious insects (Fletcher and Inglis 1926 and Thirumurthi and Abraham 1975). The myna, *Acridotheres tristis* also appears to be more useful and specific to insects. They always search on

TABLE 1

House Swift	*Apus affinis*	Very common
Palm Swift	*Cypsiurus parvus*	Very common
Green Bee-eater	*Merops orientalis*	Less common
Bluetailed Bee-eater	*Merops philippinus*	Less common
Indian Roller	*Coracias benghalensis*	Very common
Hoopoe	*Upupa epops*	Rare
Black Drongo	*Dicrurus adsimilis*	Very common
Grey Drongo	*Dicrurus leucophaeus*	Less common
Common Myna	*Acridotheres tristis*	Very common
Indian Tree Pie	*Dendrocitta rufa*	Rare
House Crow	*Corvus splendens*	Very common
Jungle Crow	*Corvus macrorhynchos*	Common
Redvented Bulbul	*Pycnonotus cafer*	Common
Common Babbler	*Turdoides caudatus*	Very common
Paradise Flycatcher	*Terpsiphone paradisi*	Rare
White Wagtail	*Motacilla alba*	Less common
Koel	*Eudynamys scolopacea*	Less common
Common Indian Nightjar	*Caprimulgus asiaticus*	Rare
Cattle Egret	*Bubulcus ibis*	Common
Pond Heron	*Ardeola grayii*	Very common
Night Heron	*Nycticorax nycticorax*	Common
Black bittern	*Dupetor flavicollis*	Less common
Yellow Bittern	*Ixobrychus chinensis*	Less common
Goldenbacked Woodpecker	*Dinopium benghalense*	Rare
Purple Sunbird	*Nectarinia asiatica*	Common
Indian Peacock	*Pavo cristatus*	Common

the ground for their prey. They are active throughout the day more in the non-cropped areas and harvested fields. The two species of the swifts could be also useful as reported by Thirumurthi and Krishnadoss (1981) for managing specific pest outbreaks. The woodpecker, peacock, wagtail and babbler are less important as specific predators. The crows help to eradicate the pupae and soil insects at the time of ploughing and after the harvest. The majority of the Ciconiiformes are active around water. However, the pond heron, *Ardeola grayii* also visits the rice fields.

Among the birds the drongo, myna, swifts, roller and the pond heron are useful in the natural control of rice pests and their management, and hence deserve to be protected and encouraged.

ACKNOWLEDGEMENT

We wish to thank Dr. S. Jayaraj, the Director of Research, Tamil Nadu Agricultural University for his suggestions and for the facilities provided.

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REFERENCES

ALI, SALIM (1941): The Book of Indian Birds. Bombay Natural History Society, Bombay.

ALI, SALIM AND RIPLEY, S. D. (1969 and 1970): Handbook of the Birds of India and Pakistan. Vols. I-IV. Oxford University, Bombay.

FLETCHER, T. B., AND INGLIS, C. M. (1926): Birds of an Indian Garden. Thacker and Spink, Calcutta.

GANGULI, U. (1975): A Guide to the Birds of Delhi area, I.C.A.R., New Delhi.

THIRUMURTHI, S. AND ABRAHAM, E. V. (1975): A note on the bird predators of Death's hawk month, *Acherontia styx* W. *J. Bombay nat. Hist. Soc. 72*: 204.

THIRUMURTHI, S. AND KRISHNADOSS, D. (1981): A note on the feeding habits of swifts (Apodidae: Apodiformes). ibid. *78* (2): 378-379.

12. A QUEER NESTING SITE OF BANK MYNA, *ACRIDOTHERES GINGINIANUS*

During the month of May, 1979, on my way to Dehra Dun from Corbett National Park by road I saw a number of a huge stacks of crushed and dried sugarcane laid on open fields, stored presumably for firing the "Gur Bhattis" (jaggery making plants) in the coming season. Long rows of round holes on the side of one of them in a field 4 kilometres south-east of Afzalgarh (Distt. Bijnour, U.P.) attracted my attention. On closer scrutiny the holes turned out to be those of a nesting colony of Bank Mynas. I could count as many as 171 nest holes in this rather large stack measuring approximately 12 m × 6 m × 5 metres. The sun was bright and warm at 11.30 a.m. Most birds were sitting near the nest holes with their beaks open.

Normally the Bank Myna builds its nest in holes in mud banks. Sálim Ali & Ripley (Vol. 5 page 182) describe nesting sites of this species as "steep earth bank of rivers, sides of disused brick kilns, kutcha wells and the like; commonly also stuffed within deep-holes in revetment of masonry bridges, and down shafts of brick-lined wells often shared out with house sparrows and pigeons".